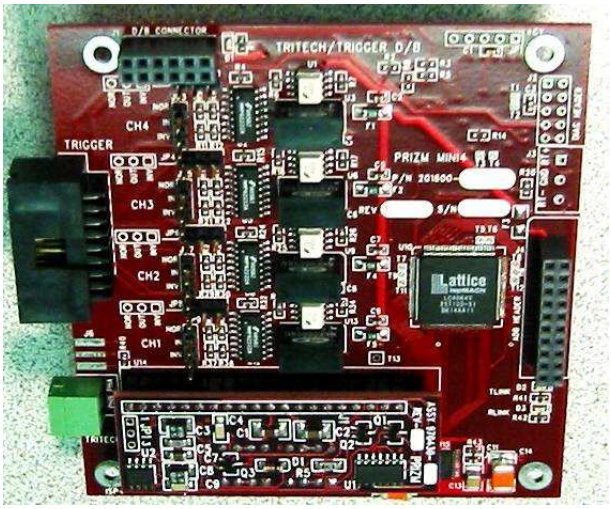
PRIZM™

Mini4 Tritech/Trigger Daughterboard (P/N 201600-xxx)

User's Manual And Troubleshooting Guide



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Revision C

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MANUAL REVISION HISTORY

REVISION NUMBER	DATE	BY	REASON FOR REVISION
A	7/27/06	LL	ORIGINAL
B	4/19/07	GSG	CORRECTIONS
C	02/23/09	IB	Updated contact information to reflect Moog Components Group

TABLE OF CONTENTS

1 MINI4 TRITECH/TRIGGER DAUGHTERBOARD, P/N: 201600-XXX 3

1.1 TRITECH/TRIGGER INTERFACE: 3
1.2 MINI4 TRITECH/TRIGGER DAUGHTERBOARD REVISION HISTORY: 3
1.3 MINI4 TRITECH/TRIGGER DAUGHTERBOARD DASH (-) NUMBER DEFINITIONS 3
1.4 MINI4 TRITECH/TRIGGER DAUGHTERBOARD OPERATION: 3
1.5 TRITECH/TRIGGER INTERFACE DAUGHTERBOARD INDICATORS AND CONTROLS: 5
1.6 MINI4 TRITECH/TRIGGER DAUGHTERBOARD SPECIFICATIONS: 11
1.7 MINI4 TRITECH/TRIGGER DAUGHTERBOARD POWER REQUIREMENTS: 11
1.8 MINI4 TRITECH/TRIGGER DAUGHTERBOARD DIMENSIONS: 11

1 Mini4 Tritech/Trigger Daughterboard, P/N: 201600-xxx

The Prizm Mini4 Tritech/Trigger daughterboard provides four channels of electrically-isolated digital Input or Output for use with most Acoustic Responder channels and a single Tritech sonar channel. This board can be either a stand-alone daughterboard or stacked onto a 201610 Mini4 RS-232 daughterboard. Refer to the 201610 Mini4 RS232 Daughterboard manual for a description of this board and other daughterboards.

Each trigger channel is electrically isolated and independently powered. The board contains jumper selections for Input/Output as well as Normal/Invert for both Input and Output signals.

1.1 Tritech/Trigger Interface:

The Tritech/Trigger daughterboard also supports the Tritech SeaKing sonar. This specific sonar uses the Arcnet protocol to carry its uplink and downlink data but operates only at the lowest Arcnet data rate, 156Kbps. Other Tritech products can be connected to the same network through this Arcnet board. A special interface hybrid board has be designed (with Tritech's support) to directly interface to this line of sonar products. If the customer has Tritech devices, these specific versions should be used to guarantee successful network communications

1.2 Mini4 Tritech/Trigger Daughterboard Revision History:

The Mini4 Tritech/Trigger daughterboard has gone through the following printed circuit board (PCB) and Assembly revisions:

PCB Revision A	Original design.
PCB Revision B	Various circuit and routing corrections.

1.3 Mini4 Tritech/Trigger Daughterboard Dash (-) Number Definitions

The Mini4 Tritech/Trigger daughterboard has a Dash Number appended to the part number. This Dash Number identifies the specific board configurations:

-001A	Original configuration, obsolete
-001B	Intended for use with TTL level (+5VDC) responders, provides for 5volt levels on the output. Supports Tritech Sonars.

1.4 Mini4 Tritech/Trigger Daughterboard Operation:

Each trigger channel circuit has its own DC-DC converter and opto-couplers to provide isolation of the I/O signals from the other channels and multiplexer system. Jumper posts JP2 though JP9 handle the setup of the trigger/responder channels.

NOTE 1: The input trigger signals must always be positive relative to the input signal's ground pin. If the input signal goes more than 2 volts below the ground pin

then the input circuitry may be damaged. The input circuitry is the base of a transistor current limited by a 15K ohm resistor.

NOTE 2: An input signal that is above approximately 2.5 Volts will be detected as a "1" while a signal below about 0.8 Volts will be detected as a "0".

NOTE 3: Any output signal will transition from approximately 0.0 Volts to +5 Volts (if a 5VDC DC-DC supply is mounted on the board). Other output voltages can be supported by changing the DC-DC converter.

For the following jumper settings discussion:

1. "normal" means the input or output signal is not inverted (i.e, +5VDC = +5VDC, 0 VDC = 0 VDC)
2. "inverted" means the input or output signal is inverted (i.e, , +5VDC = 0 VDC, 0 VDC = +5 VDC)

The input signal can be inverted or not-inverted as can be the output. Typically the board would be configured for "normal" at both ends of the fiber link.

CHANNEL 1 JUMPER SETTINGS:

JP9 selects the polarity of the input trigger signal – either "normal" or "inverted". "Normal" means the input signal is not inverted

JP8 selects the polarity of the output signal – either "normal" or "inverted".

CHANNEL 2 JUMPER SETTINGS:

JP7 selects the polarity of the input trigger signal – either "normal" or "inverted". "Normal" means the input signal is not inverted

JP6 selects the polarity of the output signal – either "normal" or "inverted".

CHANNEL 3 JUMPER SETTINGS:

JP5 selects the polarity of the input trigger signal – either "normal" or "inverted". "Normal" means the input signal is not inverted

JP4 selects the polarity of the output signal – either "normal" or "inverted".

CHANNEL 4 JUMPER SETTINGS:

JP3 selects the polarity of the input trigger signal – either "normal" or "inverted". "Normal" means the input signal is not inverted

JP2 selects the polarity of the output signal – either "normal" or "inverted".

All of the four trigger channels run through a 16-pin AMP connector on the on the left edge of the board. Refer to Section 1.5 for a pin-out of the connector.

For the Tritech section of the board to function, a Prizm Tritech hybrid board (P/N 970430-001) must be fitted to the socket at U14. This hybrid board contains the Tritech isolation transformers and associated circuitry. The Tritech sonar and processor are connected to the green 2-pin Phoenix connector located at J7 (or optionally the SMB connector at J6). The polarity of the signals must agree at both ends of the link (sonar head and the processor) for the sonar to scan.

1.5 Tritech/Trigger Interface Daughterboard Indicators and Controls:

The "TRITECH" LED (D15 on the bottom of the board under J7) will light green when Tritech signals are being received into the board and will light red when signals are being sent out of the board. This LED will be dimly lit most of the time but blink off periodically when only one sonar is operating and connected to that Tritech board. Once one or more sonar nodes are in operation at both ends of the network, the "TRITECH" LED will be dimly lit continuously or blink off only rarely.

LEDS:
There are 3 surface mount vertical LED indicators on the top of the board and 14 surface mount LED indicators (5 LEDs are right angle dual color) on the bottom of the board.

Top of Board

LED	Indication
D1 (Green)	Located at the upper left of the board serves as an indicator that +5VDC is available to the board. Supply voltage to the board is selected via the placement of fuse F6 from the Daughterboard Header (J1), F7 from the Diagnostics Header (J2), or F3 from the Auxiliary daughterboard header (J4).
D2 (Green)	Located on the lower right edge of the board, labeled 'TLINK', if "ON" provides an indication that the programmable logic device U10 is receiving a system clock and outputting data onto the Daughterboard Header (J1).
D4 (Green)	Located on the lower right edge of the board, labeled 'RLINK', if "ON" provides an indication that the programmable logic device U10 is receiving a system clock and receiveing data from the Daughterboard Header (J1).

Bottom of Board

LED	Indication
D4 (Green)	Located at the upper left of the board serves as an indicator that the microprocessor is receiving diagnostics requests from the diagnostics PC through the Diagnostics Header (J2) or Diagnostics connector (J3). This LED will blink ON with a received request then OFF with the next request.

D5 (Green)	Located at the upper center of the board serves as an indicator that the DC-DC converter U3 for Trigger channel 4 is working.
D6 (Green)	Labeled "TX DATE", located at the upper left edge of the board serves as an indicator the diagnostics data is being transmitted out of the board on the Diagnostics Header (J2) or Diagnostics connector (J3).
D7 (Green)	Located at the upper center of the board serves as an indicator that the DC-DC converter U6 for Trigger channel 3 is working.
D8 (Green)	Labeled "RX DATE", located at the upper left edge of the board serves as an indicator the diagnostics data is being received into the board on the Diagnostics Header (J2) or Diagnostics connector (J3).
D9 (Red/Green)	Located at the right center edge of the board serves as an indicator that Trigger data for channel 4 is being sent out of the board (if red) or received into the board (if green).
D10 (Red/Green)	Located at the right center edge of the board serves as an indicator that Trigger data for channel 3 is being sent out of the board (if red) or received into the board (if green).
D11 (Red/Green)	Located at the right center edge of the board serves as an indicator that Trigger data for channel 2 is being sent out of the board (if red) or received into the board (if green).
D12 (Green)	Located at the middle center of the board serves as an indicator that the DC-DC converter U9 for Trigger channel 2 is working.
D13 (Red/Green)	Located at the right center edge of the board serves as an indicator that Trigger data for channel 1 is being sent out of the board (if red) or received into the board (if green).
D14 (Green)	Located at the middle center of the board serves as an indicator that the DC-DC converter U13 for Trigger channel 1 is working.
D15 (Red/Green)	Located at the right bottom edge of the board serves as an indicator that Tritech data is being sent out of the board (if red) or received into the board (if green).
D16 (Green)	Located at the center bottom of the board serves as an indicator that power is being supplied by the board to the Display LED header (J8).
D17 (Green)	Located at the center bottom of the board serves as an indicator that +3.3VDC is available on the board, provided by U15.

CONNECTORS AND HEADERS:

J1	Daughterboard Header				
VDC Supply	1	o	o	2	VDC Supply
RXD_DB	3	o	o	4	TXD_DB
GND	5	o	o	6	GND
RXC_DB	7	o	o	8	TXC_DB
RCV LINK	9	o	o	10	Future
RXD_DB2	11	o	o	12	TXD_DB2

J2	Diagnostics Header				
RT+	1	o	o	2	RT-
GND	3	o	o	4	GND
GND	5	o	o	6	GND
+5V	7	o	o	8	+5V
+5V	9	o	o	10	+5V

J3	Diagnostics Connector
o 1	RT+
o 2	GND
o 3	RT-

J4	Auxiliary Daughterboard Header				
+5V_ADB	1	o	o	2	+5V_ADB
RX17	3	o	o	4	TX17
RX18	5	o	o	6	TX18
RX19	7	o	o	8	TX19
RX20	9	o	o	10	TX20
RX21	11	o	o	12	TX21
RX22	13	o	o	14	TX22
GND	15	o	o	16	GND
SYNC_IN	17	o	o	18	FUT_ADB
RT+	19	o	o	20	RT-

NOTE: J4 header is located at the right side of the board.
Pin 1 is the upper left pin – as identified by a square pad.

J5	Trigger Connector				
ISO_GND_D	16	o	o	16	ISO_GND_D
T4 (OUT)	14	o	o	13	R4 (IN)
ISO_GND_C	12	o	o	11	ISO_GND_C
T3 (OUT)	10	o	o	9	R3 (IN)
ISO_GND_B	8	o	o	7	ISO_GND_B
T2(OUT)	6	o	o	5	R2 (IN)
ISO_GND_A	4	o	o	3	ISO_GND_A
T1 (OUT)	2	o	o	1	R1 (IN)

NOTE: J5 connector is located at the left side of the board.
Pin 1 is the lower right pin – as identified by a square pad.

J6	Tritech SMB connector (OPTIONALLY PLACED)

J7	Tritech 2-pin Phoenix Connector
o 1	PHA
o 2	PHB

J8	Led Status Connector				
GND	1	o	o	2	PTC FUSE with +5VDC
RLINK_LED	3	o	o	4	TLINK_LED
R_TRI_LED	5	o	o	6	T_TRI_LED
R1_LED	7	o	o	8	T1_LED
R2_LED	9	o	o	10	T2_LED
R3_LED	11	o	o	12	T3_LED
R4_LED	13	o	o	14	T4_LED
FUTR1_LED	15	o	o	16	FUTT1_LED
FUTR2_LED	17	o	o	18	FUTT2_LED
FUTR3_LED	19	o	o	20	FUTT3_LED
FUTR4_LED	21	o	o	22	FUTT4_LED
NO_CONNECT	23	o	o	24	NO CONNECT

NOTE 1: J8 header is located at the bottom center side of the board.
Pin 1 is the upper right pin – as identified by a square pad.
NOTE : Signals are active low.

J12	ISP Header				
+3.3V	1	o	o	2	TMS
TCK	3	o	o	4	TDI
N/C	5	o	o	6	TDO
GND	7	o	o	8	

NOTE: J9 to be used only by PRIZM.

FUSES:
There are eight fuses for this board,

F1: 1.5 Amp PTC, Trigger channel 4 DC-DC power supply fuse

F2: 1.5 Amp PTC, Trigger channel 3 DC-DC power supply fuse

F3: 1.5 Amp PTC, Auxiliary Daughterboard header fuse at F3

F4: 1.5 Amp PTC, Trigger channel 2 DC-DC power supply fuse

F5: 1.5 Amp PTC, Trigger channel 1 DC-DC power supply fuse

F6: 1.5 Amp PTC, +5VDC input fuse for Daughterboard header at J1

F7: 1.5 Amp PTC, +5VDC input fuse for “DIAG HEADER” header at J2

F8: 1.5 Amp PTC, +5VDC output fuse for LED header at J12

SWITCHES:
There are no switches on this board.

TRIMPOTS:
There no trimpots on this board.

CONNECTORS:
There is one 16-pin right angle header on the left side of the board for connecting to the Trigger/Responder devices, an optional SMB connector for Tritech and a 2-pin Phoenix for normal connections to the Tritech.

J5: Trigger Connector

J6: Tritech sonar connector – optional SMB connector

J7: Tritech sonar connector - 2-pin Phoenix connector

There are three daughterboard stacking connectors.

J1: Daughterboard Connector

J2: Diagnostics Header – not used

J3: Auxiliary Daughterboard Header – for connection to RS-232 daughterboard

There is one 24-pin ribbon header for remote LED diagnostics display

J8: 24-pin ribbon, LED diagnostics

There is one header for programming the Lattice programmable device

J9: ISP programming header, do not use

JUMPER POSTS:

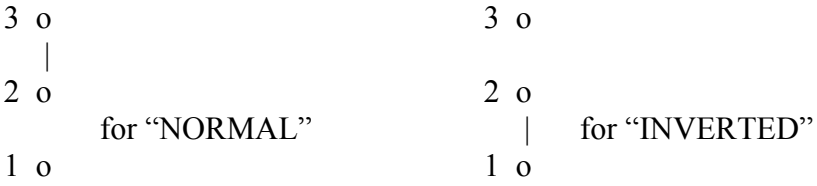
The board contains jumper posts to allow the user to configure the board for input or output of Trigger signals. Other jumpers are used for factory programming or testing and should not be move or changed.

JP1: Cypress programming header – do not use

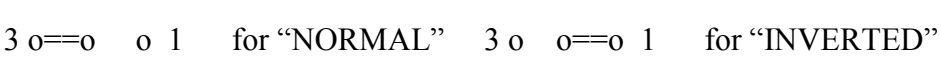
JP2: Trigger Channel 4 Output polarity select

3 o==o o 1 for “NORMAL” 3 o o==o 1 for “INVERTED”

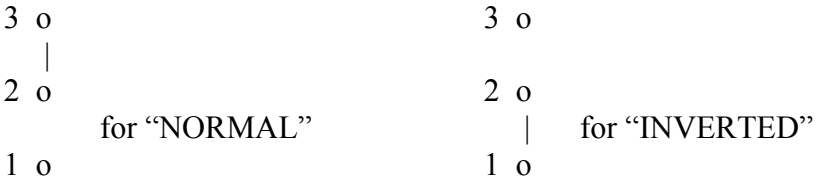
JP3: Trigger Channel 4 Input polarity select



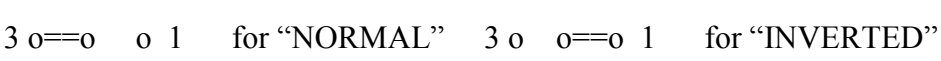
JP4: Trigger Channel 3 Output polarity select



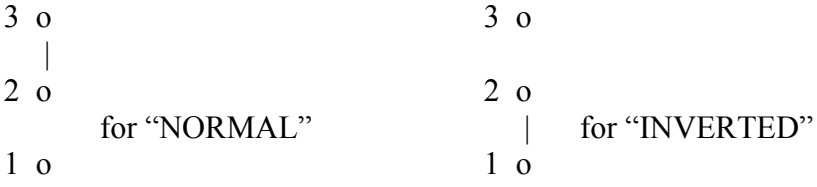
JP5: Trigger Channel 3 Input polarity select



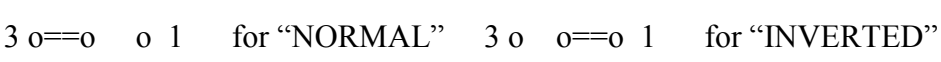
JP6: Trigger Channel 2 Output polarity select



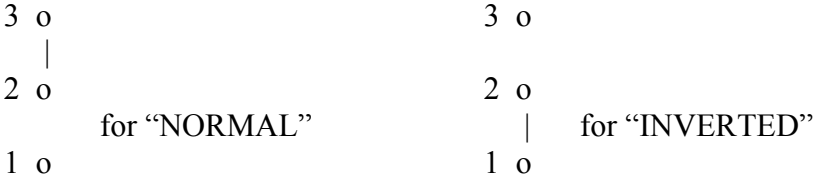
JP7: Trigger Channel 2 Input polarity select



JP8: Trigger Channel 1 Output polarity select



JP9: Trigger Channel 1 Input polarity select



1.6 Mini4 Tritech/Trigger Daughterboard Specifications:

Trigger Section:

Number of Channels:	4 bi-directional
Data rates supported:	DC to approximately 100KHz
Connector:	16-pin AMP ribbon or crimp header
Trigger delay time:	____ ms typically

Tritech Sonar Section:

Number of Channels:	one
Cable type supported:	Twisted pair with 2 pin Phoenix at J7
	Coaxial with SMB (optionally at J6)
Data rates supported:	156Kbps ONLY

1.7 Mini4 Tritech/Trigger Daughterboard Power Requirements:

The Tritech/Trigger daughterboard uses approximately 500mA @ 5VDC.

1.8 Mini4 Tritech/Trigger Daughterboard Dimensions:

PC/104 format - 95.8 mm wide x 90.17 mm long x 13 mm thick
(3.775 in x 3.550 in x 0.50 in)